



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,154	09/30/2003	Yuusuke Sato	243374US3RD	9787

22850 7590 03/06/2006

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

CHUO, TONY SHENG HSIANG

ART UNIT	PAPER NUMBER
----------	--------------

1746

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/673,154

Applicant(s)

SATO ET AL.

Examiner

Tony Chuo

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 10-14 and 16-19 is/are rejected.
- 7) ☒ Claim(s) 8, 9, 15 and 20-28 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/16/05, 9/30/05, 9/21/05, 5/12/05, 4/15/05, 2/14/05, 8/10/04, 6/24/04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: on page 25, lines 8 & 10, the reference number "105" for the fourth pump should be changed to "115", on page 25, line 9, the reference number "12" for the variable conductance valve should be changed to "112", on page 26, line 14, the reference number "70B" for the second chamber should be changed to "100B". Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1, 2, 6, 10, 11, 14 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Ogawa (US 2004/0101720). The Ogawa reference teaches a fuel cell system comprising a fuel tank "25" configured to store a fuel at a pressure higher than atmospheric pressure; a water tank "26" configured to store water to be supplied to the reformer being coupled to the fuel tank; a vaporizer "1" configured to vaporize the fuel; a reformer "4" configured to reform the vaporized fuel into a hydrogen rich gas; a CO gas removal apparatus "5" which is a semipermeable membrane that filters out hydrogen selectively; a cell unit "7" that includes a fuel electrode, an air electrode, and a polymer membrane; and a fuel that is methanol (See Figure 1 and paragraph [0019]).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3-5, 12, 13, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa (US 2004/0101720) in view of Muller et al (US 6777116).

The Ogawa reference is applied to claims 1, 2, 6, 10, 11, 14 and 17 for reasons stated above. However, the reference does not expressly teach a fuel that includes a solution of dimethyl ether and water. The Muller reference does teach a fuel that includes dimethyl ether (See Abstract). It is inherent that the saturated vapor pressure of dimethyl ether at room temperature is higher than atmospheric pressure. Since the fuel

tank and the vaporizer are connected by a valve, the vaporizer would be pressurized to a pressure higher than atmospheric pressure by the saturated vapor pressure of the fuel in the fuel tank. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Ogawa fuel cell system to include dimethyl ether as the fuel because dimethyl ether provides greater Faradaic efficiency than methanol.

6. Claims 7, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa (US 2004/0101720) in view of Kawasumi et al (US 2002/0045078). The Ogawa reference is applied to claims 1, 2, 6, 10, 11, 14 and 17 for reasons stated above. However, the reference does not expressly teach a CO gas removal apparatus that houses a CO removal catalyst to convert CO gas into the other gas or an air tank coupled to an upstream side of the CO gas removal device. The Kawasumi reference does teach a CO removal device "15" that includes a CO removal catalyst "52" (See paragraph [0020]). In addition, it also teaches an air supply "33" that is connected on the upstream side of the CO gas removal device (See Figure 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Ogawa fuel cell system to include a CO removal catalyst in the CO removal device and an air supply upstream of the CO removal device because it is well known that a CO removal catalyst will efficiently remove carbon monoxide from the reformed gas and air is required for CO removal devices that utilizes a CO removal catalyst.

Allowable Subject Matter

7. Claims 8, 9, 15, and 20-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Regarding claims 8, 9, and 20-22, the Ogawa reference teaches a fuel cell system that comprises a fuel tank, a vaporizer, a reformer, a CO gas removal apparatus, and a cell unit, but it does not expressly teach a pressurized tank connected to an upstream side of the fuel tank. Regarding claim 15, the Ogawa reference teaches a water tank, but it does not expressly teach a water tank comprising a first chamber coupled to an upper part of the fuel tank, a second chamber coupled to an upstream of the vaporizer, and a partition between the first chamber and the second chamber. Regarding claims 23-28, the Ogawa reference teaches a fuel cell system with an air supply, but it does not expressly teach an oxygen supply unit that comprises a first chamber coupled between the CO gas removal apparatus and the fuel electrode of the cell unit, a second chamber connected to the air electrode of the cell unit and a partition between the first chamber and the second chamber. In addition, it also does not expressly teach a heat pipe, fluid cylinder, first buffer tank, second buffer tank, check valve and a surface area of a second partition in the fluid cylinder that is smaller than the partition in the oxygen supply unit.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TK 2/17/06


JONATHAN CREPEAU
PRIMARY EXAMINER